

Figure 1

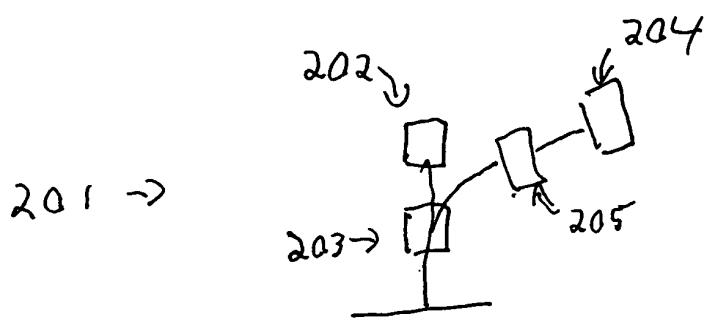


Figure 2

Expose the wafer or reticle to an influx of photons
with sufficient energy to cause photoelectrons
to leave the wafer surface or the reticle surface,

↔ 301

focus the photoelectrons to create an image
of the wafer or the reticle in the plane of a detector, and

↔ 302

detect the photoelectrons, thereby imaging
a portion of the wafer or the reticle.

↔ 303

4 0 0 1 2 0 0 6 0 0 1 2 0 0 1 4 0 0 1

Figure 3

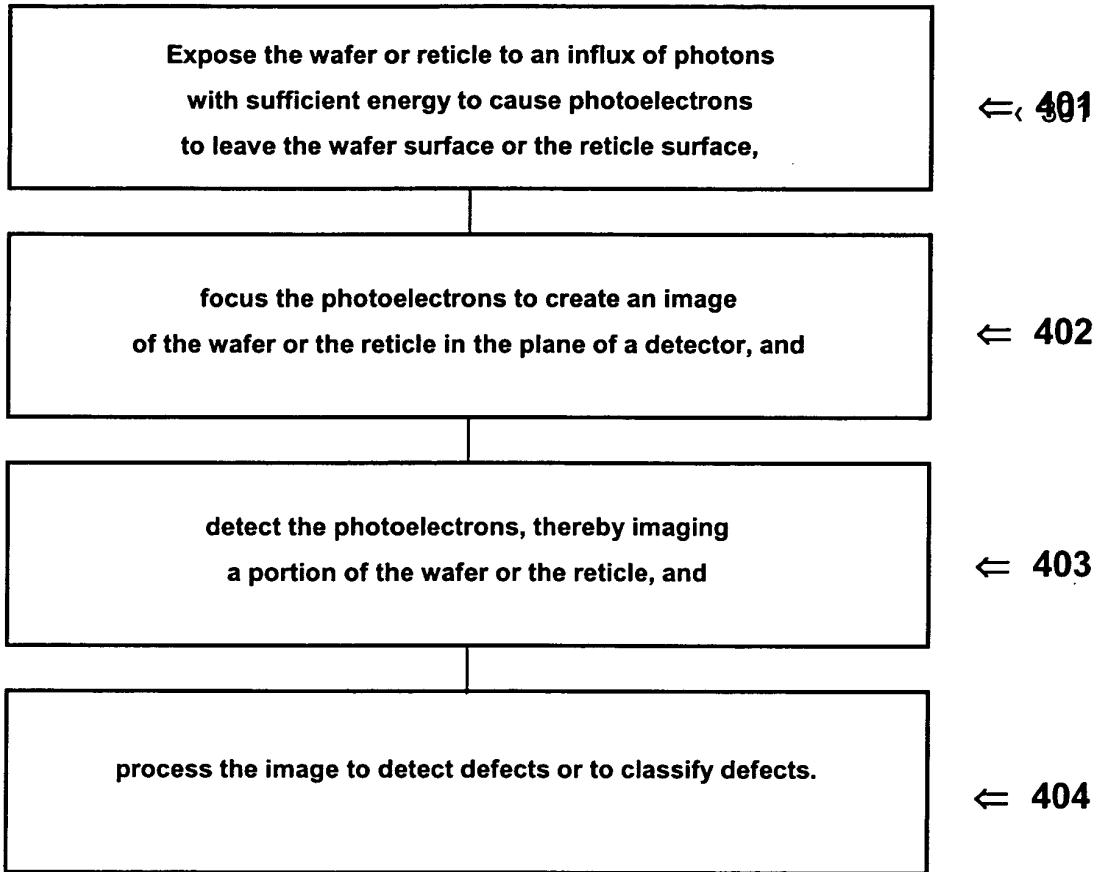


Figure 4

10012263-424404

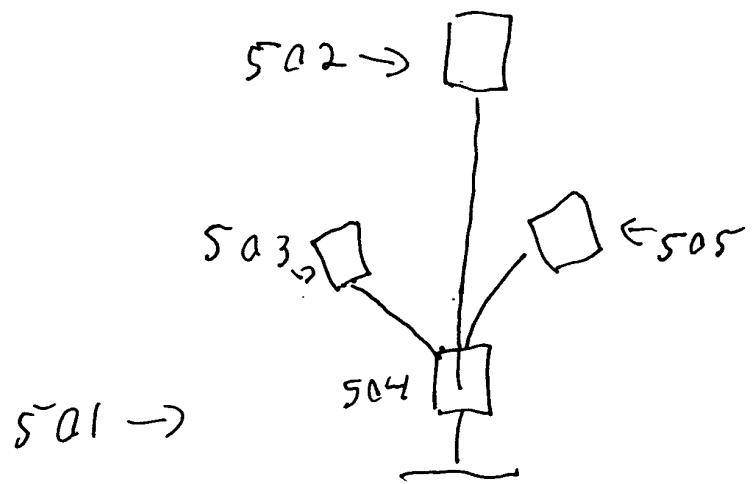


Figure 5

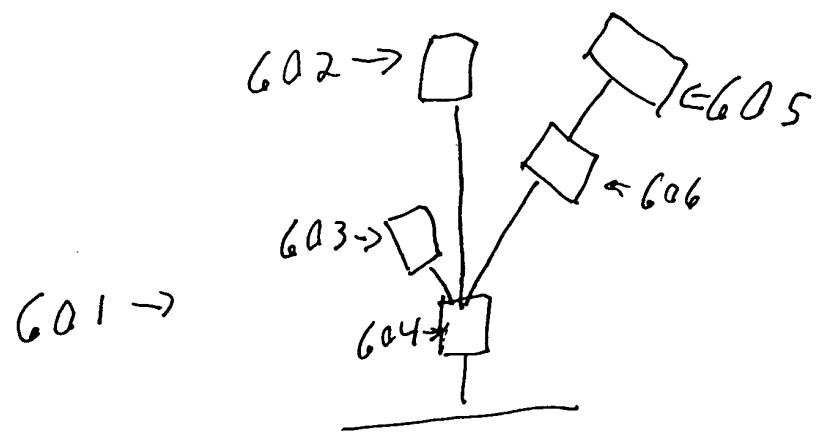


Figure 6

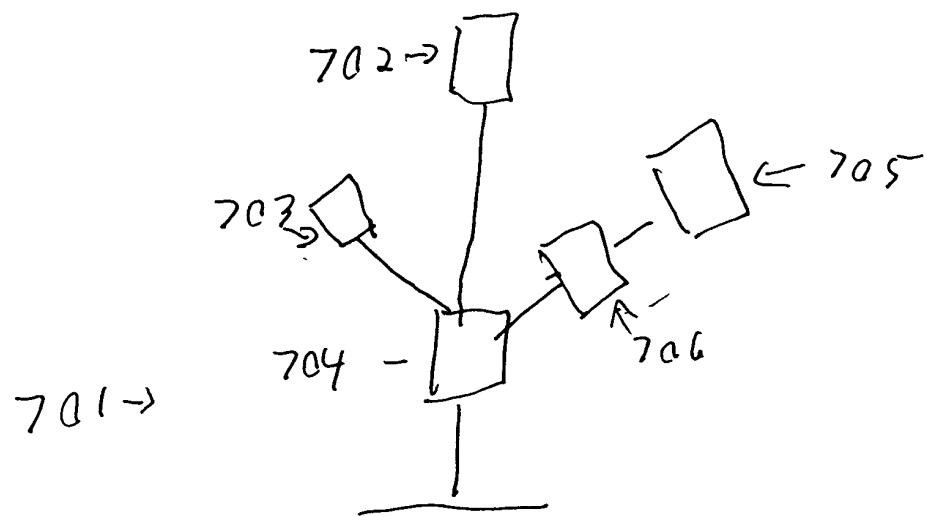


Figure 7

10017262 - 121403

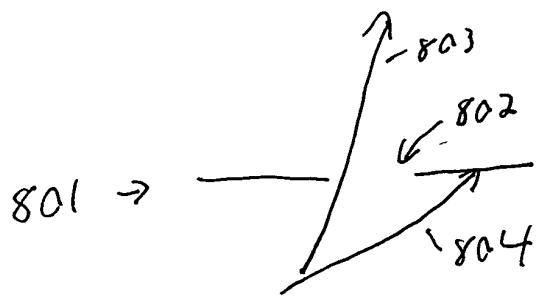


Figure 8

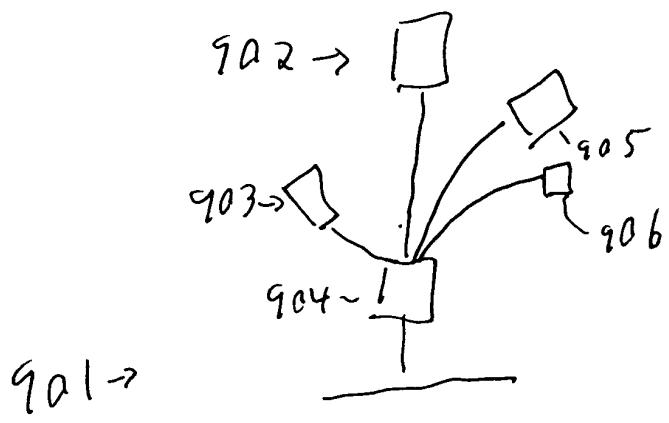


Figure 9

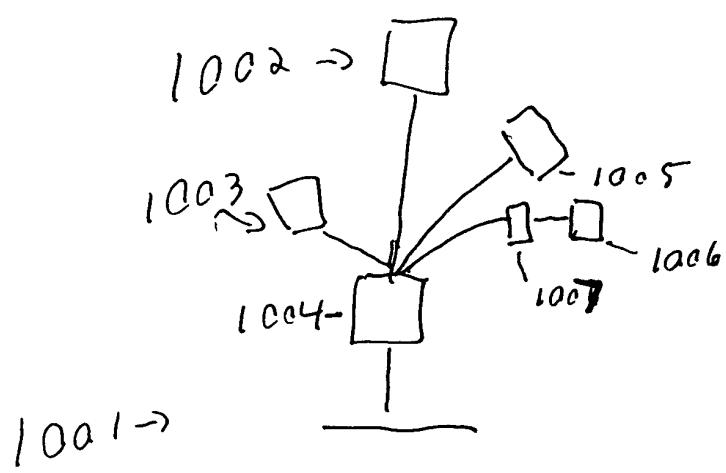


Figure 10

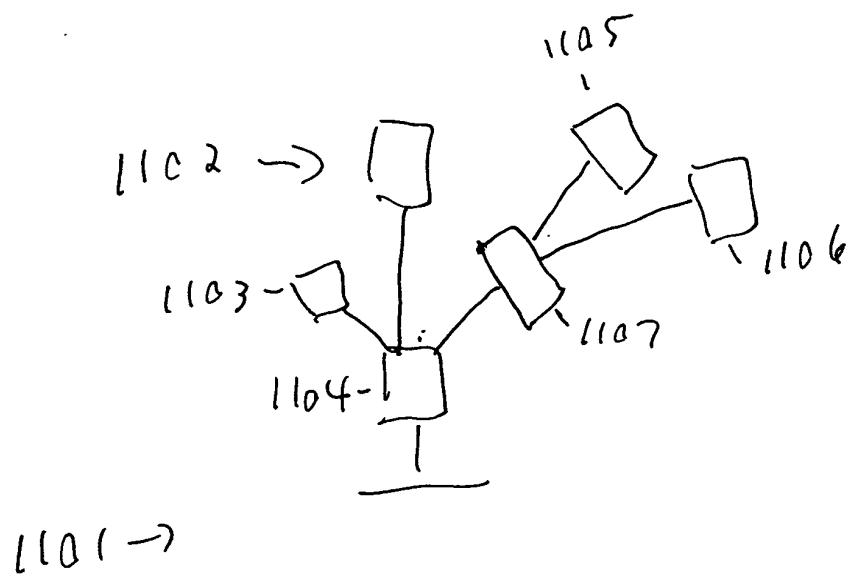


Figure 11

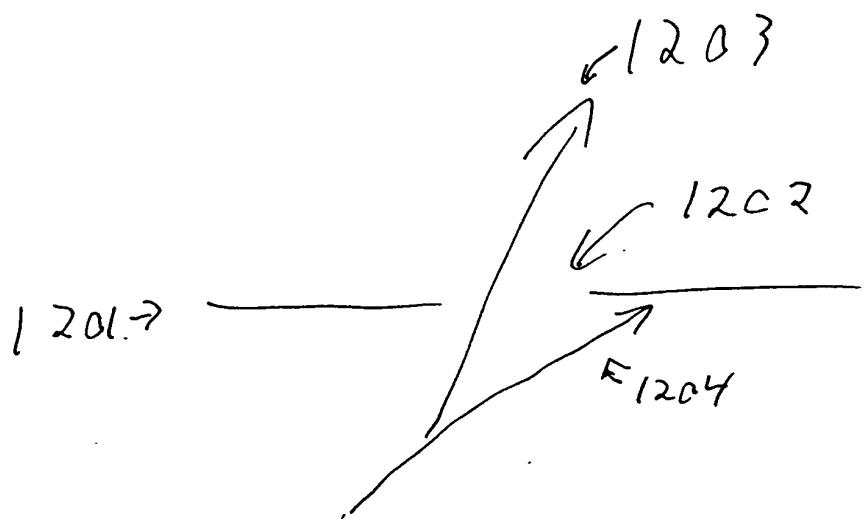
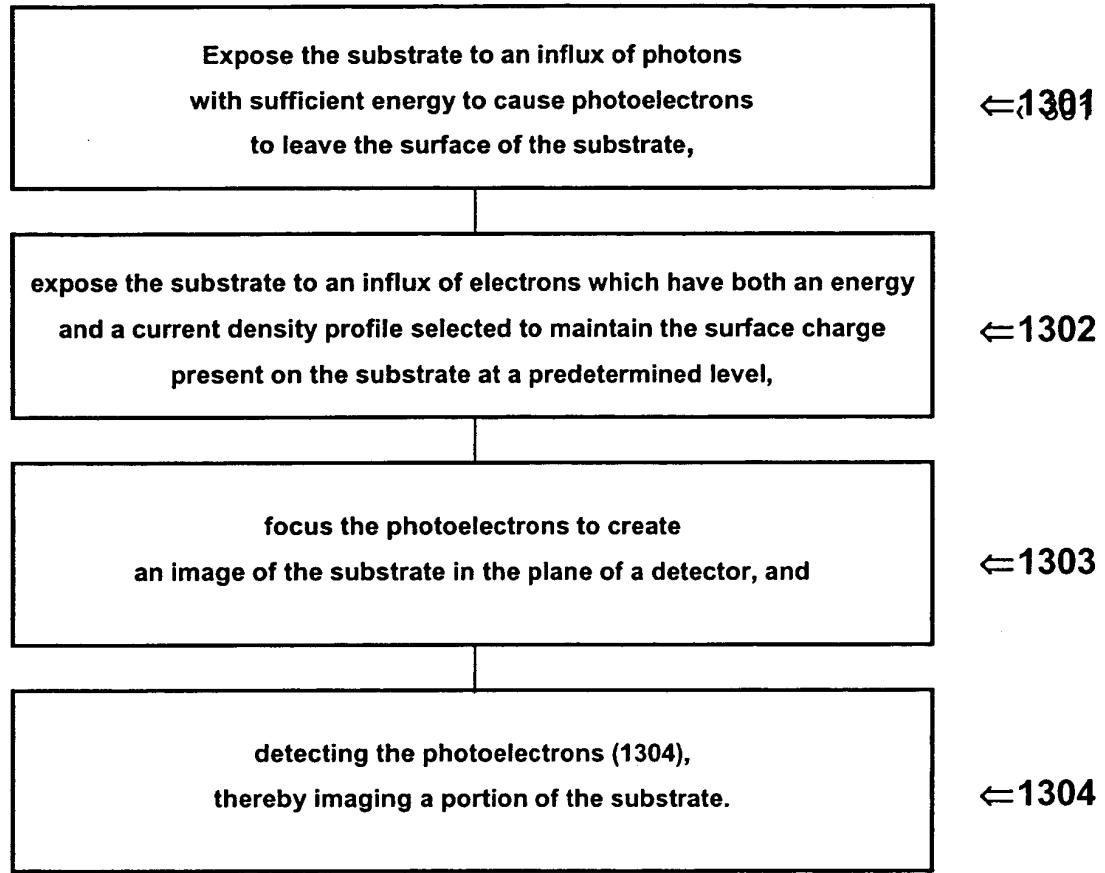


Figure 12



13012262-121401

Figure 13

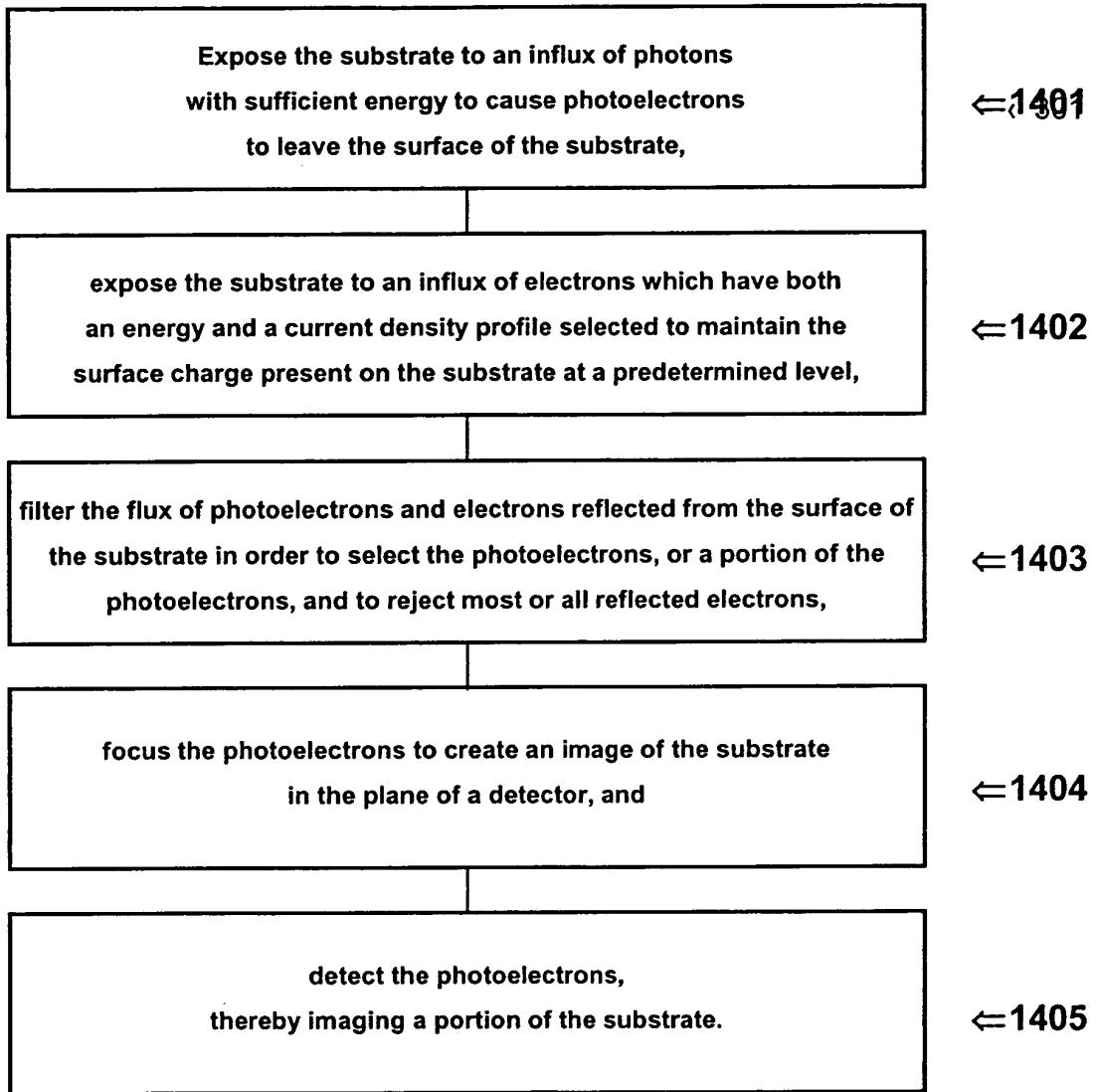


Figure 14

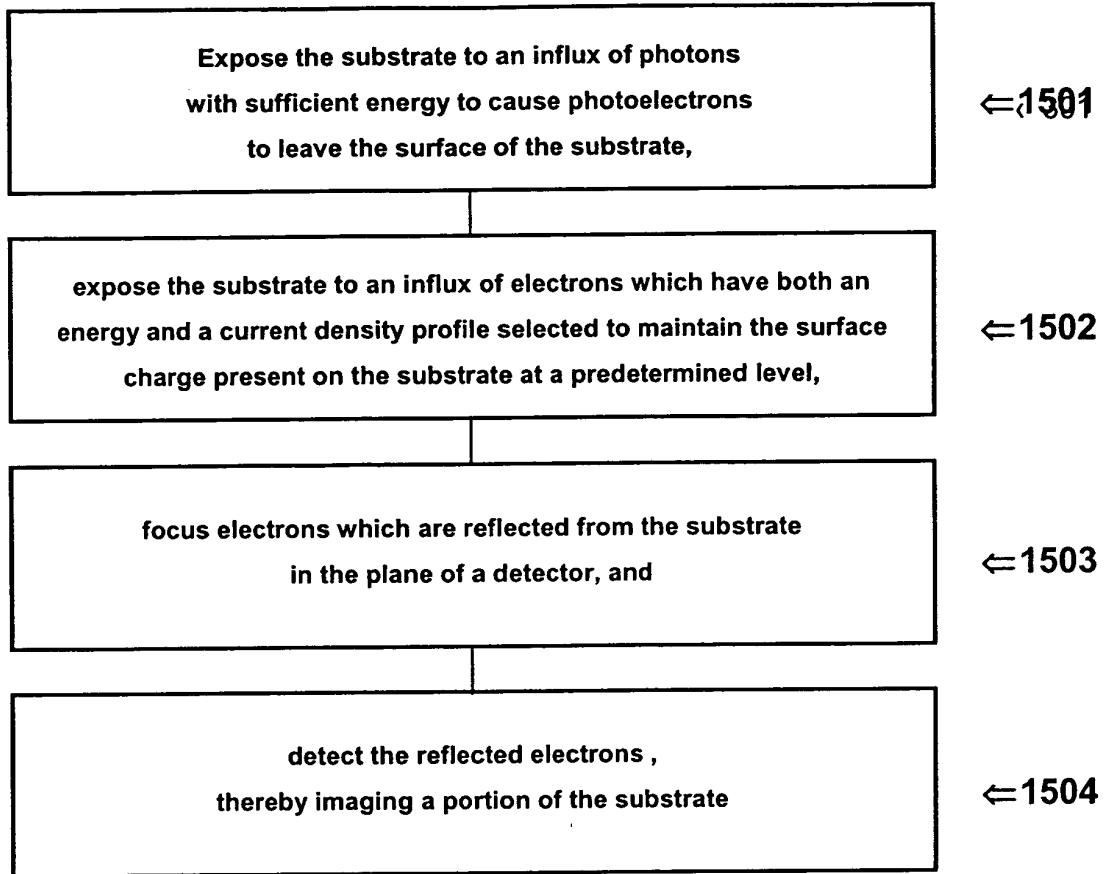


Figure 15

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Expose the substrate to an influx of photons with sufficient energy to cause photoelectrons to leave the surface of the substrate,

←1601

expose the substrate to an influx of electrons which have both an energy and a current density profile selected to maintain the surface charge present on the substrate at a predetermined level,

←1602

filter the flux of photoelectrons and electrons reflected from the surface of the substrate in order to select the reflected electrons, or a portion of the reflected electrons, and to reject most or all of the photoelectrons,

←1603

focus reflected electrons in the plane of a detector, and

←1604

detect the reflected electrons,
thereby imaging a portion of the substrate

←1605

10012362121001

Figure 16

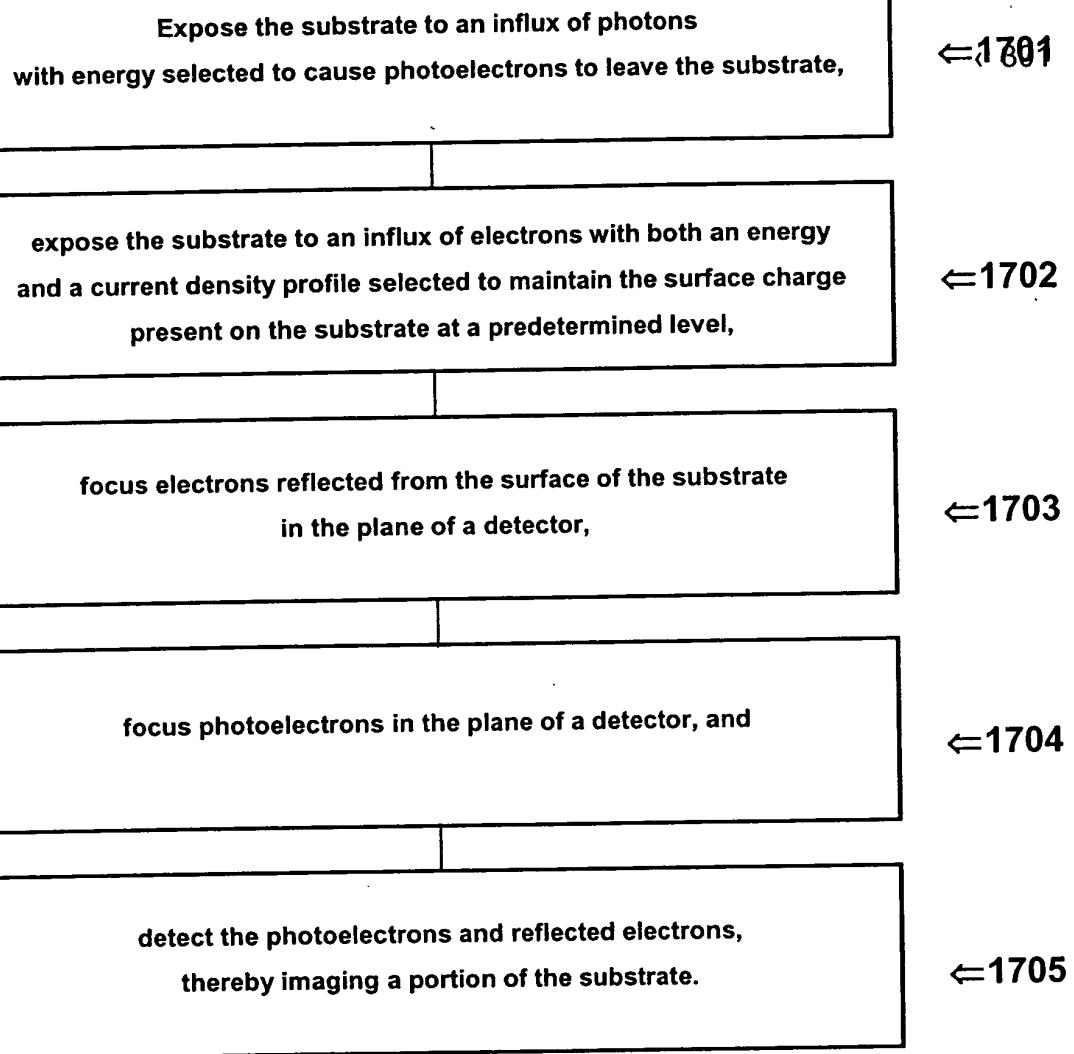


Figure 17

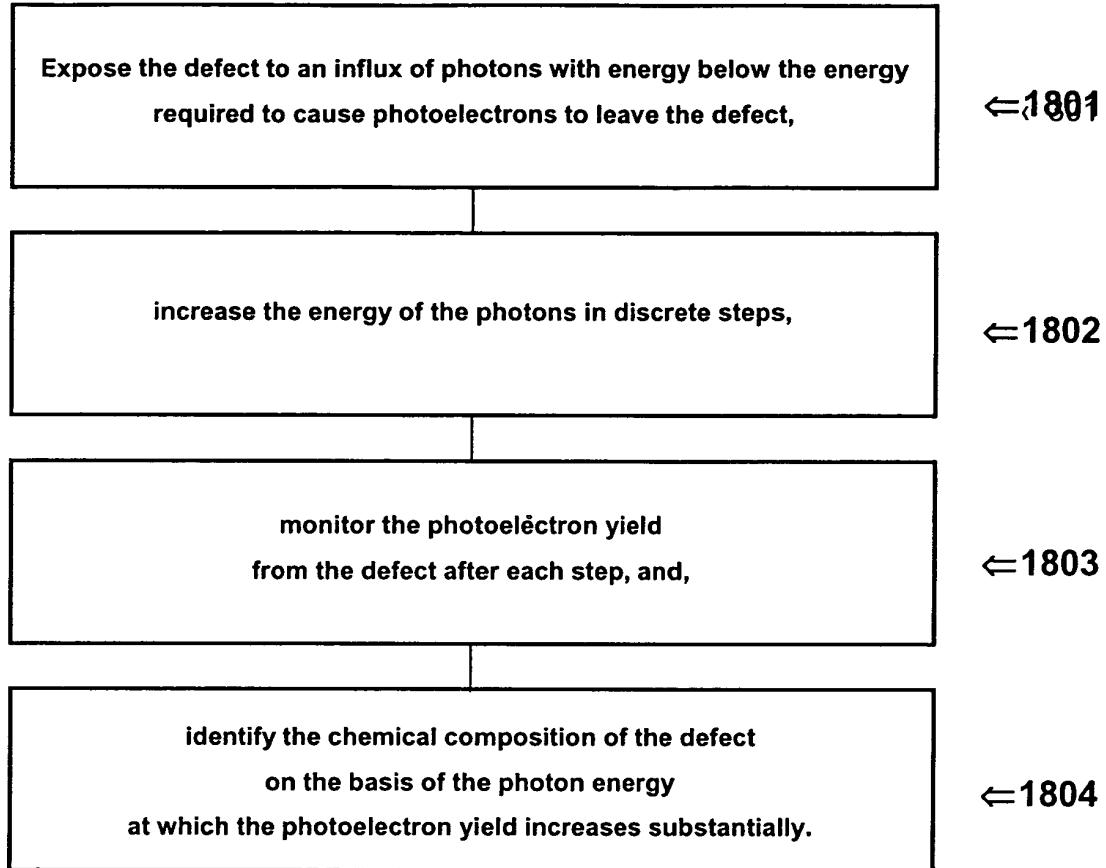


Figure 18

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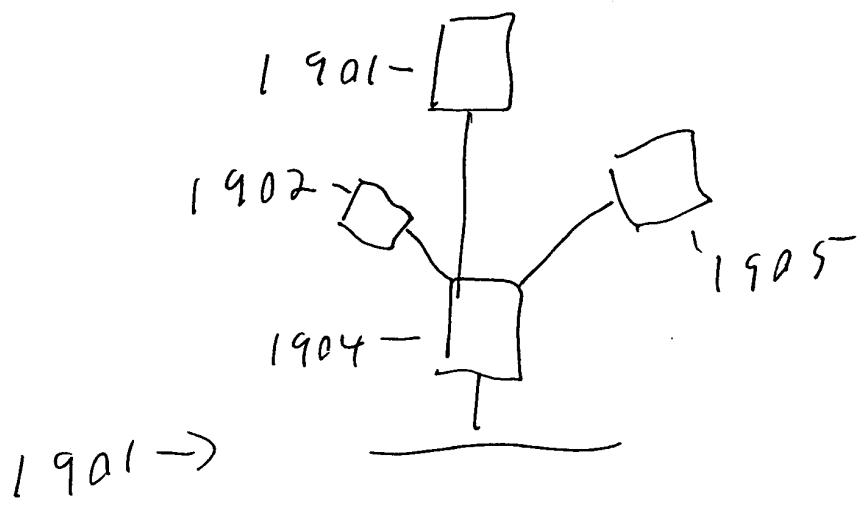


Figure 19

1001262 - 121401

2001

2002

Figure 20

Expose the substrate to an influx of relatively high-energy electrons,
with energy selected to cause secondary electrons
to leave the substrate,

←2101

exposing the substrate to an influx of relatively low-energy electrons, with
both an energy and a current density profile selected to maintain surface
charge present on the substrate at a predetermined level,

←2102

filter the flux of secondary electrons and low-energy electrons reflected
from the surface of the substrate in order to select most or all of the
secondary electrons, or a portion of the secondary electrons, and to reject
most or all of the reflected electrons,

←2103

focus the secondary electrons to create
an image of the substrate in the plane of a detector, and

←2104

detect the secondary electrons,
thereby imaging a portion of the substrate.

←2105

40014362 43101
TOP SECRET

Figure 21

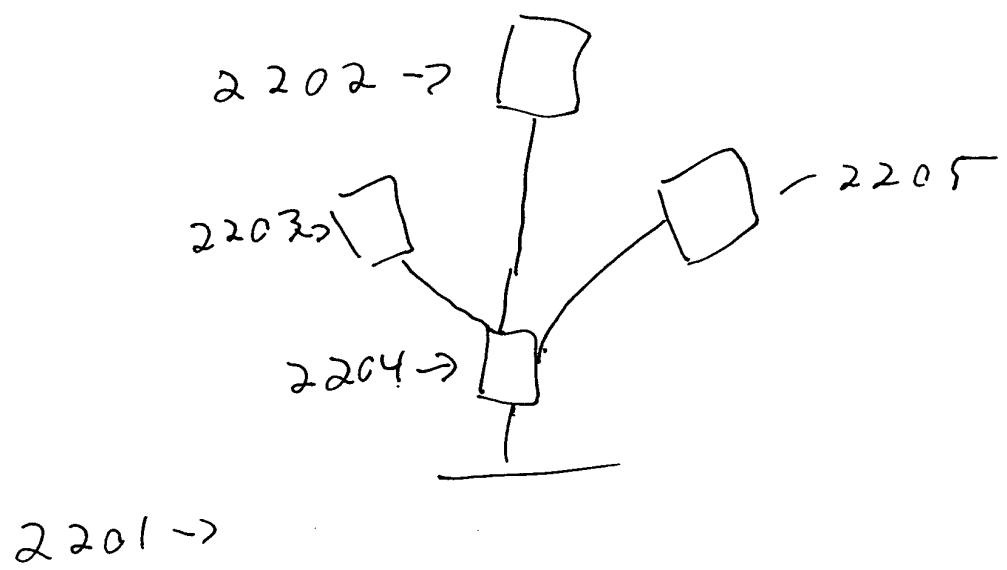


Figure 22

10012262 121401

2301 
2302 

Figure 23

Expose the substrate to an influx of relatively high-energy electrons,
with energy selected to cause secondary electrons
to leave the substrate,

←2401

exposing the substrate to an influx of relatively low-energy electrons, with
both an energy and a current density profile selected to maintain surface
charge present on the substrate at a predetermined level,

←2402

filter the flux of secondary electrons and low-energy electrons reflected
from the surface of the substrate in order to select most or all of the
reflected electrons, or a portion of the reflected electrons,
and to reject most or all of the secondary electrons,

←2403

focus the reflected electrons to create
an image of the substrate in the plane of a detector, and

←2404

detect the reflected electrons,
thereby imaging a portion of the substrate.

←2405

Figure 24

1001242000 2001242000 2001242000 2001242000

Expose the substrate to an influx of relatively high-energy electrons,
with energy selected to cause secondary electrons
to leave the substrate,

←2501

expose the substrate to an influx of relatively low-energy electrons, with
both an energy and a current density profile selected to maintain surface
charge present on the substrate at a predetermined level,

←2502

filter the secondary electrons and the portion of relatively low-energy
electrons which are reflected from the surface of the substrate, in order to
select most or all of the secondary electrons which are emitted at angles
other than perpendicular to the substrate and most or all of the reflected
electrons which are scattered away from the specular angle, and to reject
most or all of the secondary electrons which are emitted at an angle
perpendicular to the substrate and most or all of the reflected electrons
which are scattered at the specular angle,

←2503

focus the selected secondary and reflected electrons
to create an image of the substrate in the plane of a detector, and

←2504

detect the selected secondary and reflected electrons,
thereby imaging a portion of the substrate.

←2505

Figure 25

10017263 424401